UNITED STATES PATENT AND TRADEMARK OFFICE

UNITED STATES DEPARTMENT OF COMMERCE
United States Patent and Trademark Office
Address: COMMISSIONER FOR PATENTS
P.O. Box 1450
Alexandria, Virginia 22313-1450
www.uspto.gov

APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/808,218	03/24/2004	Kazuya Ueda	1324.70174	3929

7590 12/11/2006

Patrick G. Burns, Esq.
GREER, BURNS & CRAIN, LTD.
Suite 2500
300 South Wacker Drive
Chicago, IL 60606

EXAMINER	
CHEN, WEN YING PATTY	

ART UNIT	PAPER NUMBER
2871	

DATE MAILED: 12/11/2006

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary	Application No.	Applicant(s)	
	10/808,218	UEDA ET AL.	
	Examiner	Art Unit	
	W. Patty Chen	2871	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1)☒ Responsive to communication(s) filed on *29 September 2006*.

2a)☐ This action is **FINAL**. 2b)☒ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4)☒ Claim(s) *1-15* is/are pending in the application.

4a) Of the above claim(s) _____ is/are withdrawn from consideration.

5)☐ Claim(s) _____ is/are allowed.

6)☒ Claim(s) *1-15* is/are rejected.

7)☐ Claim(s) _____ is/are objected to.

8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

9)☐ The specification is objected to by the Examiner.

10)☐ The drawing(s) filed on _____ is/are: a)☐ accepted or b)☐ objected to by the Examiner.

Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).

11)☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

12)☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

a)☒ All b)☐ Some * c)☐ None of:

1.☒ Certified copies of the priority documents have been received.

2.☐ Certified copies of the priority documents have been received in Application No. _____.

3.☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

1) ☐ Notice of References Cited (PTO-892)
2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3) ☐ Information Disclosure Statement(s) (PTO/SB/08) Paper No(s)/Mail Date _____.
4) ☐ Interview Summary (PTO-413) Paper No(s)/Mail Date. _____.
5) ☐ Notice of Informal Patent Application
6) ☐ Other: _____.

DETAILED ACTION

Continued Examination Under 37 CFR 1.114

A request for continued examination under 37 CFR 1.114, including the fee set forth in 37 CFR 1.17(e), was filed in this application after final rejection. Since this application is eligible for continued examination under 37 CFR 1.114, and the fee set forth in 37 CFR 1.17(e) has been timely paid, the finality of the previous Office action has been withdrawn pursuant to 37 CFR 1.114. Applicant's submission filed on Sept. 29, 2006 has been entered.

Response to Amendment

Applicant's Amendment filed on Sept. 29, 2006 has been entered. Claims 1-15 remain pending in the current application.

Claim Rejections - 35 USC § 103

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

> (a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negatived by the manner in which the invention was made.

The factual inquiries set forth in *Graham* **v.** *John Deere Co.*, 383 U.S. 1, 148 USPQ 459 (1966), that are applied for establishing a background for determining obviousness under 35 U.S.C. 103(a) are summarized as follows:

1. Determining the scope and contents of the prior art.

2. Ascertaining the differences between the prior art and the claims at issue.
3. Resolving the level of ordinary skill in the pertinent art.
4. Considering objective evidence present in the application indicating obviousness or nonobviousness.

This application currently names joint inventors. In considering patentability of the claims under 35 U.S.C. 103(a), the examiner presumes that the subject matter of the various claims was commonly owned at the time any inventions covered therein were made absent any evidence to the contrary. Applicant is advised of the obligation under 37 CFR 1.56 to point out the inventor and invention dates of each claim that was not commonly owned at the time a later invention was made in order for the examiner to consider the applicability of 35 U.S.C. 103(c) and potential 35 U.S.C. 102(e), (f) or (g) prior art under 35 U.S.C. 103(a).

Claims 1, 6-10 and 13-14 are rejected under 35 U.S.C. 103(a) as being unpatentable over Aoki et al. (US 5644415) in view of Yoshida et al. (US 5936693).

With respect to claim 1 (Amended): Aoki et al. disclose in Figure 10 a liquid crystal display comprising:

a pair of substrates (elements 1, 2) provided opposite to each other with one of the substrates having a pixel electrode (element 3) and the other of the substrates having a common electrode (element 4);

a liquid crystal (element 9) sealed between a pair of substrates; and

a pixel region including at least one low effective voltage area (as shown in Figure 3, element P2) in which an effective voltage applied by the pixel and the common electrodes to the liquid crystal is lower than a voltage applied between the pixel and the common electrodes at another area, the at least one low effective area occupying part of the region in a predetermined

area ratio (Column 7, lines 3-9), the pixel region having a threshold voltage that is different between the at least one low effective voltage area and said another area, and

the pixel region also including a color filter layer (element CF) having one color formed on at least one of the pair of substrates that includes a blue color filter (as shown).

Aoki et al. fail to disclose that the effective voltage in the pixel region is different from that in another pixel region including a color filter layer having another color such that the effective voltage in the low effective voltage areas associated with the blue color filter is lower than the effective voltage in the low effective voltage areas associated with color filters of colors other than blue.

However, Yoshida et al. teach in Figure 29 and Column 18 lines 8-26 of forming effective voltage in the pixel region including one color filter layer of one color different from that in another pixel region including a color filter layer having another color such that the effective voltage in the low effective voltage areas associated with the blue color filter is lower than the effective voltage in the low effective voltage areas associated with color filters of colors other than blue (wherein the low effective area of the blue color filter is larger than the red and the green color filters).

Therefore, it would have been obvious to one of ordinary skill in the art at the time the invention was made to construct a liquid crystal display device as taught by Aoki et al. wherein the effective voltage of one pixel region of one color is different from that of another pixel region of another color as taught by Yoshida et al., since Yoshida et al. teach that such configuration between the different colored pixel regions helps to obtain images having a good

color balance with compensation made for the differences in brightness among the different colored pixels (Column 18, lines 20-26).

As to claim 7: Aoki et al. further disclose in Column 17 line 59 through Column 18 line 6 that the threshold voltage of the low effective voltage area is higher than the threshold voltage of the other area by a predetermined voltage difference; and the voltage difference is in the range from 0.1V to 2.0V.

As to claim 8 (Amended): Yoshida et al. further teach in Column 18 lines 8-12 of forming different area ratios with respect to the center transmission wavelength λ of the color filter layer that the pixel region has.

As to claim 9: Aoki et al. further disclose in Figure 10 that the low effective voltage area has a dielectric layer (element 10) formed with a predetermined thickness on at least one of the electrodes.

As to claim 10: Aoki et al. further disclose in Figure 10 that the dielectric layer (element 10) is formed like stripes (Column 9, lines 53-61) having a predetermined layer width and gap width.

As to claim 13 (Amended): Aoki et al. further disclose in Figure 10 that the low effective voltage area is provided in the vicinity of an end of the pixel region (as shown in Figure 10, wherein one of the low effective voltage area is at the edge of the pixel region).

As to claim 14: Aoki et al. further disclose that the liquid crystal is a nematic liquid crystal (Column 1, line 36) having a negative dielectric constant anisotropy (Column 2, lines 43-47 and 51-55) whose initial alignment is vertical to a surface of the substrates (Column 1, line 42).

With respect to claim 6 (Amended): Aoki et al. disclose in Figure 10 a liquid crystal display, comprising:

a pair of substrates (elements 1, 2) provided opposite to each other with one of the substrates having a pixel electrode (element 3) and the other of the substrates having a common electrode (element 4);

a liquid crystal (element 9) sealed between a pair of substrates; and

a pixel region including at least one low effective voltage area (as shown in Figure 3, element P2) in which an effective voltage applied by the pixel and the common electrodes to the liquid crystal is lower than a voltage applied between the pixel and the common electrodes at another area, the at least one low effective area occupying part of the region in a predetermined area ratio, the pixel region having a threshold voltage that is different between the at least one low effective voltage area and said another area.

Aoki et al. failed to specifically disclose that the area ratio of the low effective voltage area to total area of each pixel region is in the range from 0.6 to 0.8.

However, Yoshida et al. disclose in Figure 11, Table 1, Column 8 lines 35-45 and Column 10 lines 24-26 that the area ratio of the low effective voltage area to total area of each pixel region can be set in the range from 0.3 to 0.7, thus result in overlapping of ranges and renders the claim limitation obvious. *see MPEP §2144.05[R-5] Obviousness of Ranges*

Therefore, it would have been obvious to one of ordinary skill in the art at the time the invention was made to construct a liquid crystal display device as taught by Aoki et al. wherein the area ratio of the low effective voltage area to total area of each pixel region are set in the range as taught by Yoshida et al., since Yoshida et al. teach that by setting the area ratio of the

low effective voltage area in a specific area ratio allows adjustment of the contrast ratio of the pixel to the desired values (Column 10, lines 35-38).

Claims 2-5 are rejected under 35 U.S.C. 103(a) as being unpatentable over Aoki et al. (US 5644415) and Yoshida et al. (US 5936693) in view of Nishida et al. (US 2002/0030780).

With respect to claims 2-4: Aoki et al. and Yoshida et al. disclose all of the limitations set forth in claim 1, but fail to disclose the retardation values of the liquid crystal layer thickness with respect to different wavelength satisfying the equations set forth in claims 2-4.

However, Nishida et al. disclose a liquid crystal display wherein the Δn of the liquid crystal layer regardless the wavelength value is set to be constant (Paragraph 0186, wherein Δn is 0.0067) and that $d_i / \lambda_i = d_j / \lambda_j$ (Paragraph 0072) regardless of having tilt angle and white is displayed when no polarizer is provided (Paragraphs 0072-0082), therefore, the condition set forth in claims 2 and 4 are met. Nishida et al. further disclose that the wavelength closest to 545 nm (Paragraph 0082, wherein the wavelength is 550nm) has a thickness value of 4.5μm, therefore,

Δn*(4.5μm) = 301.5nm,

which satisfies the condition set forth in claim 3.

Therefore, it would have been obvious to one of ordinary skill in the art at the time the invention was made to construct a liquid crystal display device as taught by Aoki et al. and Yoshida et al. wherein the retardation values of the liquid crystal layer thickness with respect to different wavelength are set as taught by Nishida et al., since Nishida et al. teach that such display characteristic prevents the display from coloring from whichever direction the display

apparatus is viewed and that gradation reversal over a larger visibility angle range is also prevented (Paragraphs 0059-0061).

As to claim 5: Aoki et al. and Yoshida et al. disclose all of the limitations set forth in claim 1, but fail to disclose the retardation values of the constant liquid crystal layer thickness with respect to different wavelength is between 250nm and 450nm.

However, Nishida et al. disclose a liquid crystal display wherein the Δn of the liquid crystal layer regardless the wavelength value is set to be constant (Paragraph 0186, wherein Δn is 0.0067) and that the thickness of the liquid crystal layer is set to be 4.5 μm (Paragraph 0186), thus have a $\Delta n(\lambda k)*d = 301.5$nm, which is within 250nm and 450nm.

Therefore, it would have been obvious to one of ordinary skill in the art at the time the invention was made to construct a liquid crystal display device as taught by Aoki et al. and Yoshida et al. wherein the retardation values of the constant liquid crystal layer thickness with respect to different wavelength is between 250nm and 450nm as taught by Nishida et al., since Nishida et al. teach that such display characteristic optimizes the brightness of a white display and the color reproduction property (Paragraph 0186).

Claims 11-12 and 15 are rejected under 35 U.S.C. 103(a) as being unpatentable over Aoki et al. (US 5644415) and Yoshida et al. (US 5936693) in view of Kubo et al. (US 2002/0075436).

With respect to claim 11: Aoki et al. and Yoshida et al. disclose all of the limitations set forth in claim 1, but fail to disclose that the low effective voltage area has an electrode portion with blanks, formed on at least one of the electrodes.

However, Kubo et al. disclose in Figure 18B a liquid crystal display wherein the low effective voltage area (element 14a) has an electrode portion with blanks (element 14a), formed on at least one of the electrodes (element 14b).

Therefore, it would have been obvious to one of ordinary skill in the art at the time the invention was made to construct a liquid crystal display as taught by Aoki et al. and Yoshida et al. wherein the low effective voltage area has an electrode portion with blanks as taught by Kubo et al., since Kubo et al. teach that by forming blanks on the electrodes in the low effective voltage areas helps to stabilize the inclined orientation of the liquid crystal (Paragraph 0221).

As to claim 12: Aoki et al. further disclose in Figure 10 that the low effective voltage area is formed like stripes (Column 9, lines 53-61) having a predetermined layer width and gap width and Kubo et al. teach that blanks are formed on the electrode portion in the low effective voltage area, therefore, the blanks would be formed like stripes corresponding to the low effective voltage areas having a predetermined electrode width and gap width.

As to claim 15: Aoki et al. and Yoshida et al. disclose all of the limitations set forth in claim 14, but fail to disclose that the liquid crystal display further comprising an alignment regulating structure for regulating the alignment of the liquid crystal provided on at least one of the substrates, wherein the pixel region has a plurality of alignment regions in which the liquid crystal is aligned in different directions.

However, Kubo et al. disclose in Figure 29A a liquid crystal display comprising of alignment regulating structures (element 22b) on at least one of the substrates.

Therefore, it would have been obvious to one of ordinary skill in the art at the time the invention was made to construct a liquid crystal display as taught by Aoki et al. and Yoshida et

al. wherein the liquid crystal display further comprises alignment regulating structures as taught by Kubo et al., since Kubo et al. teach that the alignment structures helps to stabilize the radially-inclined orientation regardless of the applied voltage, thus results in a desirable stress resistance (Paragraph 0285).

Response to Arguments

Applicant's arguments with respect to claim 6 have been considered but are moot in view of the new ground(s) of rejection.

Applicant's arguments filed on Sept. 29, 2006 have been fully considered but they are not persuasive.

Regarding claim 1, Applicant argues that Yoshida teaches in Figure 33 and Column 18 line 61 that the blue filter has a thinner thickness as compare to the other colored color filters, thus result in a higher effective voltage which failed to teach the amended claim 1.

However, as set forth in the Office Action above, in another embodiment as shown in Figure 29, Yoshida teaches that the thicknesses of the color filters are the same and further that the low effective area of the blue color filter is larger than the red and the green color filters, thus result in the blue color filter having lower effective voltage than the other color filters.

Conclusion

Any inquiry concerning this communication or earlier communications from the examiner should be directed to W. Patty Chen whose telephone number is (571)272-8444. The examiner can normally be reached on 8:00-5:00 M-F.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, David C. Nelms can be reached on (571)272-1787. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see http://pair-direct.uspto.gov. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

W. Patty Chen
Examiner
Art Unit 2871

WPC
11/28/06

ANDREW SCHECHTER
PRIMARY EXAMINER